THE FOREST RESOURCES AND INDUSTRIES OF THE CARIBBEAN AREA[1/]

General Status of Knowledge as Shown by a Brief Survey of Readily Available Literature

There is no one comprehensive, authoritative publication dealing with the forest resources and industries of the Caribbean area; it is necessary to rely on scattered published material of varying and oftentimes unknown reliability. This material may be divided into two classes: 1) factual records and surveys, of which there is none applying to the Caribbean area as a whole; 2) estimates and commentaries by observers. Both classes of information exist in the form of publications by governments and other official bodies; publications originating in private research, educational, professional and industrial organizations; and publications in trade journals and other popular literature sources.

Factual Records and Surveys

There are no factual records or surveys of Caribbean forest areas comparable to those available for the United States, with the possible exception of records from the British colonies. Over twenty years ago, Tom Gill found that reports of British colonial forest conservators and forest departments contain the most up-to-date and authentic information regarding forest resources and forest activities to be found in the American tropics. The records in these offices continue to provide good information. In 1947, J. H. Hughes issued The Forest Resources of British Guiana, which, however, covers chiefly the commercial, accessible, Crown forests. Publications of the Forest Department of British Honduras contain considerable resource information, and one economic study of this country is available, called Supply, Consumption and Marketing of Timber in British Honduras, by N. S. Stevenson, issued in 1935.

In a 1947 report on Forest Research within the Caribbean Area, the Caribbean Commission (composed of representatives from the United States, Great Britain, Netherlands, France and independent Caribbean republics) tabulated the status of land and forest valuation surveys. It found that, out of eleven Caribbean countries or groups of colonies, survey work had been done in six, to the extent noted below:

> Trinidad and Tobago: The entire forest has been enumerated on a 1 percent basis. A complete land allocation policy for Trinidad has been prepared. Detailed statistics of consumption of local and imported lumber are kept.

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October 23, 1950

British Guiana: Valuation surveys have been carried out (1 to 2½ percent) over 7,000 square miles. Consumption statistics considered inadequate.

British Honduras: An aerial land survey and trigonometrical framework are available. A ground check of vegetation and topography is in progress. Samples of forest types have been enumerated and when correlated with aerial surveys, volume estimates are possible. Pine forests covering 1,000 square miles have already been assessed in three quality classes.

Leeward Islands: Land utilization maps based on surveys exist. Timber surveys have been made. (Extent not indicated.)

Windward Islands: Land utilization maps based on surveys exist. Timber surveys are in progress.

It may also be noted from this same publication that the public forests of Puerto Rico have been almost completely surveyed on a 5 percent basis, to determine stocking and composition. A general study of forest products consumption was made in 1945.

Another official organization which may eventually serve as a clearing-house of information about Caribbean forest resources and industries is the Food and Agriculture Organization of the United Nations. Their publications, Forest Resources of the World (1948) and Yearbook of Forest Product Statistics, give forestry statistics for a number of Caribbean countries, although the representation is far from complete. FAO lays no claim to accuracy in presenting these statistics (covering forest area, ownership, volume of growing stock, production, trade, etc.); they are provided by the participating countries, which in most cases do not have complete and reliable data or records to draw upon. However, FAO statistics do stand as a starting point, and they represent some revision of knowledge since Zon and Sparhawk's Forest Resources of the World was published in 1923.

Certain issues of FAO's forestry periodical, Unasylva, have devoted space to the forest situation in Caribbean countries. Those of January/February and May/June 1948 deal with Latin American forestry problems. The former issue mentions the need for systematic inventories, and cites work in Guatemala and Colombia which is in progress. It states that statistics on requirements and production are not available in Central America and Mexico.

Another current periodical devoted to forestry is the Caribbean Forester, issued by the Tropical Forest Experiment Station of the U.S. Forest Service located in Puerto Rico. In addition to articles on silvicultural and basic research aspects of Caribbean forestry, it

presents some work of broader economic scope dealing with resources and industries of such countries as the Dominican Republic, Haiti, Mexico, French Colonial possessions, and others.

Another useful source of information is Tropical Woods, published at irregular intervals by the Yale School of Forestry. It provides considerable qualified observation about Latin American forests and industries. During Prof. Record's lifetime the Current Literature section of the magazine was particularly helpful to anyone wishing to keep abreast of published material. Economic studies were listed, as well as the botanical and wood technological material one might expect the magazine to concentrate upon. A perusal of this Current Literature section throughout the years gives a fairly good indication of the scarcity of reliable economic information concerning Caribbean forests.

The Armour Research Foundation of Illinois Institute of Technology sponsored a survey of selected Mexican industries in the early 1940's. Its report on forest industries reveals the lack of factual information available even to industrial investigators, who may approach their problems from a different viewpoint than scientific investigators. From this report we find that "At least a dozen books and a hundred reports have been written on 'The Forest Resources of Mexico.' Yet the truth of the matter is that none of these can tell what these resources are, because nowhere in the course of all these studies has anyone found out." Scattered information possessed by the Mexican forest service, and by Mexican or foreign industries has not been correlated. The Mexican government has designated a commission for collecting data, but this commission suffers from lack of funds and trained personnel to make a survey or to correlate information. Nor is botanical and wood technology information complete.

Inasmuch as the exploitation of Mexican forests requires a government permit, it might be assumed that through this mechanism accurate forest production statistics would be available. Unfortunately, illegal logging and other unreported forest drain prevent these figures from giving a true picture. The Armour investigators believed that actual production might be two or three times the amount reported by the Mexican forest service and by other official statistical sources.

H. A. Meyer, a United States forester, states that the files of the Mexican forest service contain "many valuable reports on specific forest areas of the country.... Many of these reports have also been published in official bulletins" and elsewhere. One such publication appeared in 1937, as a bulletin of the Mexican Departmento Forestal y de Caza y de Pesca. It gives a delineation of the forest area and forest types in Mexico and contains the map often reproduced in other works on Mexico's forest resource. José García Martínez, the author of this bulletin, is also the author of another more detailed work on the exploitation of Mexican pines (1938). This mimeographed report includes a general inventory and some production statistics, but since

it is based on the forest service records it too must be considered incomplete. It may be further noted that Mexico did not provide the FAO with statistics on its forest resources in response to the latter's questionnaire on "Forest Resources of the World," which resulted in a special report in 1948. Presumably, the Mexican Government did not consider its knowledge of forest resources sufficiently accurate for the purpose.

Some information on Mexican forest resources and industries was presented by E. Dupre Ceniceros, at the 1948 Inter-American Conference on Conservation of Renewable Resources and at the United Nations Scientific Conference in 1949, but this too was necessarily of a general character.

J. L. Muller and T. P. Douber, in their Forest Resources and Lumber Economy of Mexico (1944), a study issued through the U.S. Bureau of Foreign and Domestic Commerce, suggest that most estimates of Mexico's forest resources are based on personal judgment. These authors attempt to evaluate any resource and production statistics they present in their publication, but they say they cannot even make a rough guess about domestic consumption of lumber.

The United States has contributed to Latin American forest development by sending missions to various Caribbean countries. Cooperating with the Office of the Coordinator of Inter-American Affairs, Forest Service investigators wrote a report on the forests of Costa Rica in 1943. They found no available statistics of forest area or volume, but some of their number were able to make cruder estimates concerning certain forest areas as seen from the air. K. D. Garver, of the U.S. Forest Service, in his study of forest-survey needs of the Republic of Panama, 1947, found that no attempt had been made to compile information on the forests of that country through a systematic inventory or even to assemble estimates of timber volume made by experienced persons. Similarly, as a member of an FAO mission to Nicaragua in 1949, Garver found only fragmentary information available on that country's forest resources and industries.

The Bureau of Foreign and Domestic Commerce and its partial successor, the Office of International Trade, have issued several publications dealing with forest resources and industries of such countries as Colombia, Cuba, Guatemala, Honduras and British Honduras. Much of their information originates with Foreign Service reports. It includes information about costs of lumber production, transportation and trade. Additional trade statistics for Caribbean areas may be found in Bureau of the Census publications and in those of the Tariff Commission. Forest resource information from these sources is largely confined to generalities about area and forest types.

Further information of a general nature about forests and forest industries appears from time to time in material issued by the Pan American

Union, the Inter-American Institute of Agricultural Science, the Institute of Inter-American Affairs, the Office of Foreign Agricultural Relations (U.S.D.A.), and in foreign service reports from the State Department. The West Indies Yearbook, published by the Canada Gazette, has the advantage of giving forest area, production and trade statistics in one publication. However, the publishers of this yearbook cannot be said to have access to information unobtainable elsewhere.

Personal Observations and Estimates

A. General Conditions of the Forest

Most observers, unless highly untrained and limited in viewpoint, agree that 1) forest inventory information is lacking, and 2) tropical forests do not, upon close examination, prove to be vast, inexhaustible storehouses of useful timbers awaiting exploitation on a grand scale. The reverse of point number 2 is, nevertheless, according to British tropical forester Rule, "a view not uncommonly held, often in otherwise well-informed quarters." Mr. Rule summarizes his opinion that tropical timbers have limited usefulness in meeting world timber demand in an article appearing in the Empire Forestry Review (1947).

Speaking further of resource and land conditions, Arthur Bevan in the Caribbean Forester (1943) states that "denuded forest lands are much more common than most people imagine." This applies particularly to areas around centers of population and along the shores of rivers. C. D. Mell, writing back in 1926 for the Pan American Union, in an article entitled "Some Reasons Why Tropical American Timber Operations Have Failed" remarks that, "The quantity of timber available on a specific area is almost always much smaller than that which the estimates call for;" while a later author, industrial forester J. J. Schmitt, makes an almost identical observation in 1940. It is well known that mahogany, the tree for which so many Caribbean forests are "creamed," occurs on most sites at a frequency of 1 tree per 2 to 5 acres. Tom Gill, in his Tropical Forests of the Caribbean (1951), warns that reports from owners of timberland in the area are heavily to be discounted. He further advises that anyone investigating information sources move cautiously, beyond (at that time) the writings of Record & Mell, Zon & Sparhawk, Tropical Woods, and reports from British colonial forest services.

Muller and Dauber, in their section on pine lands of Mexico, state that, "The concensus is that the forest cover in general would be called light compared with our western pine timber lands.... Various acreage estimates place the area of coniferous forests anywhere from 1 million to 5 million acres." William Vogt says, "There is little climax forest left in Mexico, and even in national parks that have been lumbered over, repeated burning, grazing and cutting make

impossible normal succession." Another observer cited in Tropical Woods, Sept. 1946, states that, "The volume of timber of all species in the forests of British Honduras is low compared with commercial hardwood forests in Africa or Europe. Over most of the Colony the volume of utilizable secondary hardwoods varies from 150 to 350 board feet per acre. This is close to the volume of mahogany and cedar in good virgin forest." A strip cruise run by the United Fruit Company in eastern Nicaragua, and described in Tropical Woods for March 1948, also records volumes relatively low. When Fahnstock and Garratt reported on Nicaraguan pine (Pinus caribaea) in Tropical Woods for September 1958 they remarked that the stands were thin, averaging about 3,000 board feet per acre.

B. Logging and Lumbering Operations

Most publications about logging and lumbering operations in the Caribbean area represent a fantastic jumble of exaggeration, conjecture and vague generality. However, it would be a possible, if arduous, task to glean some fairly realistic information from some scattered sources. Here the lumber trade journals and populer publications enter the picture. For example, Paper Industry and Paper World for November, 1946, describes the establishment of a pulp mill in Jalisco, Mexico, and its supporting pulpwood operation. A rough inventory of the stands is given, based on aerial survey. Consumption estimates are made and other economic factors in the operation are outlined. Wood (Chicago) is a periodical which has presented some fairly meaty articles on Central American lumbering. One by A. C. Hart in April, 1947, outlined an operation in Costa Rica. The progressive logging practices of Señor Medina in Yucatan have recently been publicized in Lumberman and Americas. Lumberman (formerly West Coast Lumberman), Timberman and other trade journals have long carried material on tropical logging, much of it, however, of inexplicit nature.

Most accounts of tropical logging are vague on the point of equipment. One giving rather more detail than some appears in the New York State College of Forestry Ranger School Alumni News for 1949, by D. B. Harrison, manager of a private American concern logging in Guatemala and British Honduras. The same publication in 1940 presented a succint summary of factors affecting lumber production in Latin America. The author is J. J. Schmitt, a representative of the Texas Company. These factors are: 1) disregard for costs of production, 2) logging for a few "precious" species, 3) lack of markets for predominant and secondary species, 4) inadequate transportation, 5) lack of skilled labor, 6) quantity of lumber actually removed from any stand much less than estimated, 7) climate, and 8) political conditions. Many other accounts of operations in Central America and in the Caribbean area are elaborations or variations on one or all of the above points.

Some Utilization Studies

Another interesting area of information about Caribbean forestry lies in the utilization field. Some of the sources already mentioned cover this subject, but it might be well to mention a survey made by Teesdale and Girard in Puerto Rico, published in 1945 by the U.S. Forest Service. These observers estimated the forest resource area, volume, growth and drain, described logging operations, discussed domestic requirements and made suggestions for industry development.

In addition to Record & Hess' encyclopedic Timbers of the New World (1943), other utilization information concerning Caribbean woods may be found in publications of the Timber Development Association, London, and the British Forest Products Research Laboratory. Publications in this field are increasing rapidly.

Policy and Law

A final factor affecting forestry and lumbering in the Caribbean area is policy and law. Arthur Bevan believes that the forest laws in tropical America, where they exist, are fairly advanced. However, pressure of circumstance still dictates forest practices on the ground. It has already been suggested that Mexican statutes are not enforced. A Costa Rican law prohibiting the cutting of magnificent oak along the highway of the Cordillera de Talamanca is not enforced, and so forth. It would appear then that many Caribbean forest policies and laws are mere good intentions on paper.

Lumbermen are sometimes reluctant to undertake operations in certain countries where they feel social legislation may be adverse. Regarding Mexican statutes, R. J. Gutierres of California has said "I have found that neither the labor laws nor the agrarian laws constitute a serious problem for anyone wishing to operate in Mexico." (Timberman, April 1943.)

This brief survey by no means covers every sort of material which could give information about Caribbean forests and forest industries. It should show, however, that not even 1 percent of the area involved has been surveyed systematically; that no over-all reliable statistics exist for production, requirements or consumption of forest products; and that what beginnings have been made toward remedying this situation exist chiefly as good intentions on paper.